Space Weather Forecast

Issued on Friday, 30 September 2022 at 01:17 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Minor-Moderate geomagnetic storms expected to develop from late today (30th) or through tomorrow. Chance of Strong from CME arrival tomorrow.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with only minor Common class flares, the largest of which appears to have originated from around the northeast limb. There are currently four numbered sunspots on the visible disc, all either stable or gradually decaying. AR3110 remains the largest on the visible disc, and moderately geomagnetically complex with a beta-gamma configuration. The remaining groups are relatively small and magnetically simple.

Solar Wind / Geomagnetic Activity: Solar wind parameters where indicative of a continued high speed stream influence, with the solar wind initially slightly elevated between approximately 450-500 km/s. Then during the morning the solar wind increased, becoming elevated by the middle of the day, with speeds generally 500-550 km/s, although ending the day closer to 500 km/s. The strength of the magnetic field of the solar wind was weak throughout. The important north-south component of the solar wind was initially positive, then weakly fluctuated to become southward at times. The resulting geomagnetic activity was Quiet.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at or near normal background levels, and well below the level of a solar radiation storm.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be generally Low, with a chance of isolated Moderate-class flares, especially as a returning region is likely to rotate onto the disc today.

Solar Wind / Geomagnetic Activity: The CME from the filament eruption on 28/0400 UTC has the potential to move across Earth tomorrow (1st). Solar winds are expected to be steady at first today, around elevated levels, before the next fast wind enhancements arrive later today and also tomorrow, then persisting through days 3 and 4 (2nd and 3rd). Quiet geomagnetic activity at first, with possible isolated Unsettled intervals. Then geomagnetic activity is expected to increase later today to Minor to Moderate storm levels. Activity levels may increase further tomorrow from any CME arrival, with a chance of isolated Strong Storms intervals. Activity easing to Quiet to Unsettled by late day 4 (3rd).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to persist close to background levels with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	80	80	70	30
Strong	G3	No	20	30	10	1
Severe	G4	No	1	5	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	20	25	30	30
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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